

Making a 3-D Map from a Topographic Map

Materials:

2 Copies of the Topographic Cutout Map Worksheet

Modeling material in two different colors

Scissors

Glue stick

1. Carefully cut out the colored map of ONE member of your group. Save the other map! The example illustrated here is of the Aleutian Islands, Alaska.



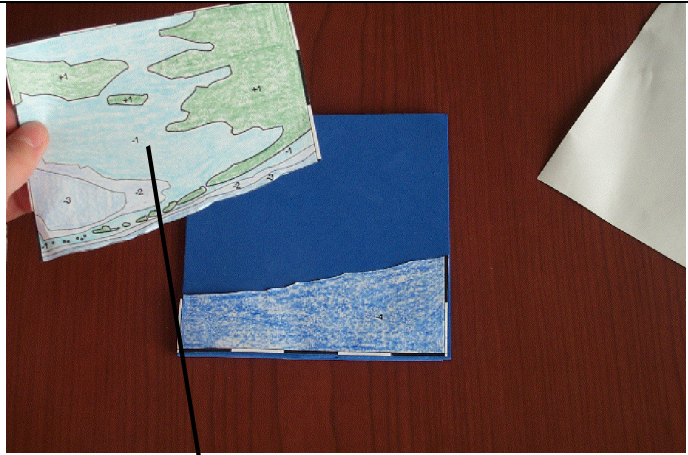
2. Trim the foam (or other material) until it is exactly the same size as the map you just cut out. This is the -5 layer.

** If your map does not have a -5 layer repeat step 2 until you reach your lowest depth layer. For example, the lowest depth for Iceland is -2 so four layers are needed to represent -5, -4, -3 and -2 layers. So you will have 4 whole squares as your bottom. Once enough layers are built up in the 3-D map to represent the DEEPEST elevation on the map, go on to step 3.

For the Aleutian Islands, Alaska, there is no -5 layer; that full piece of foam is the bottom. -4 is the lowest elevation, so that layer remains whole, too. The next step describes what to do when you have reached your lowest elevation and are ready to begin cutting out pieces.

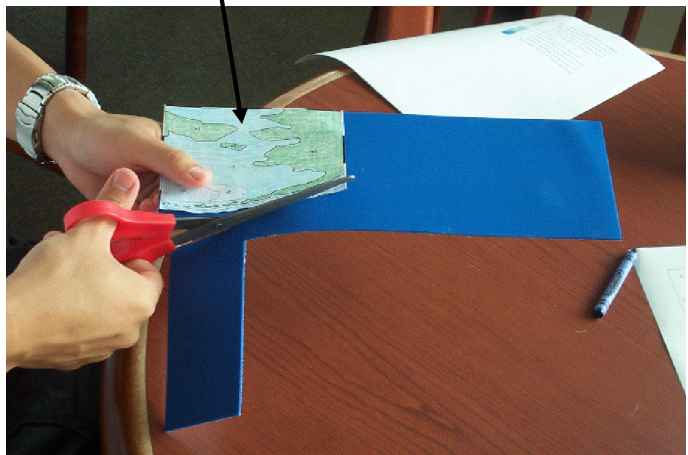


3. Carefully cut out ONLY the part of the map that's the deepest elevation. Lay this piece of paper on top of the square for that elevation, in the spot where it goes on the map. (Use the other pieces to see exactly where it should go.)



4. Take what is left of your map and trace and cut out a piece of foam in that shape. This is the shape of the next lowest layer on your map.

In this example, you cut out a piece of foam for everything above -4.



5. Place the foam piece in the appropriate place on your 3-D map, on top of the lowest layer. Use the paper map pieces as a guide.

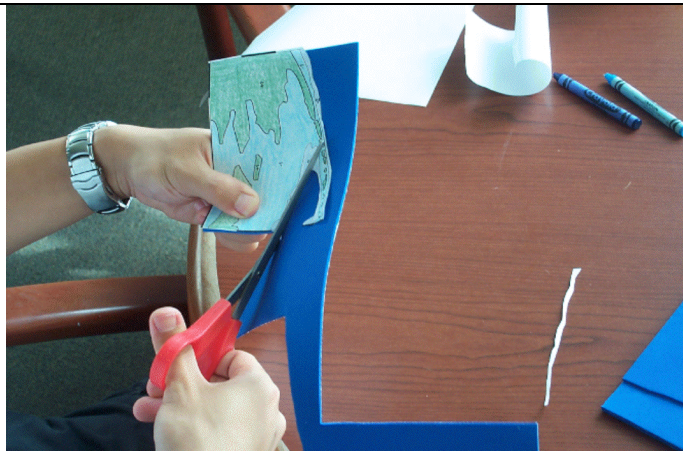


6. From the remaining map, cut out all parts marked the next depth (-3)**.

7. Put these paper pieces from the map on top of the foam in the appropriate place.



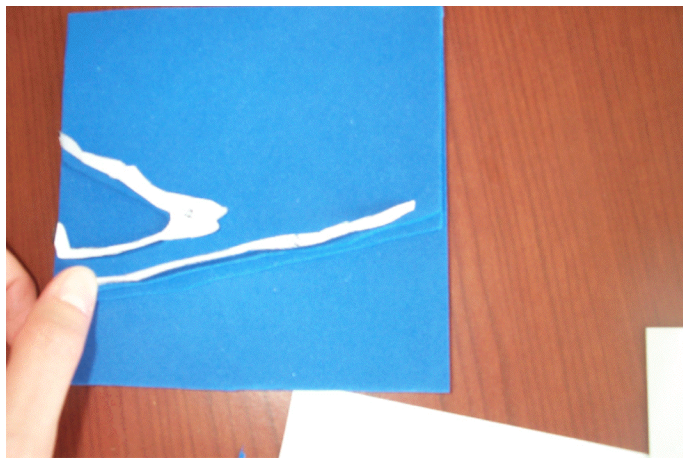
8. Take the other pieces of the map and carefully trace and cut out a piece of foam in this shape. For this example, this is the (-2) layer.



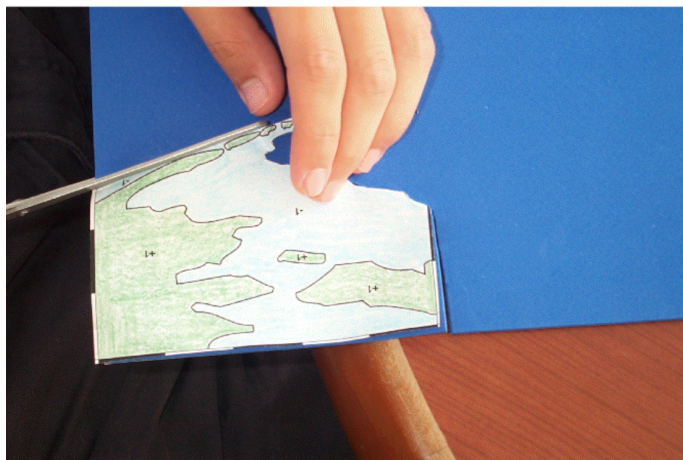
9. Put these new pieces of foam on top of the others in the appropriate place. Glue together the foam pieces you have already completed.



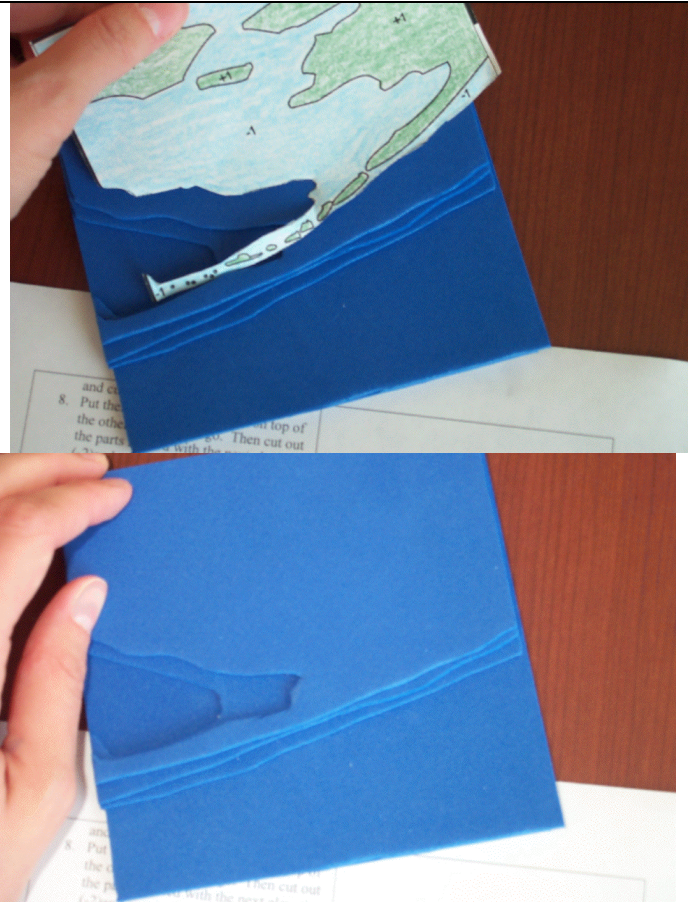
10. Take what is left of your map, cut the area marked the next elevation (-2), and put them on top of the foam. The white strips in the picture at the right are the paper map pieces labeled (-2).



11. Repeat these steps for the remaining layers that are below sea level.



This is what the 3-D map of Alaska looks like after cutting layers -5, -4, -3, and layer -2.



12. Now remove the sections labeled layer -1 from the paper map. All that remains is +1 and higher, which are above sea level. Switch to the other color of foam. Trace the patterns and place on top of the last layer of foam.



13. Glue the +1 layer down. Continue with the rest of the layers that are above sea level until you reach the top of your earth structure.



This is what the finished 3-D map of the Aleutian Islands looks like. Notice the change in color or shading for the land above sea level.

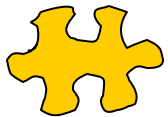
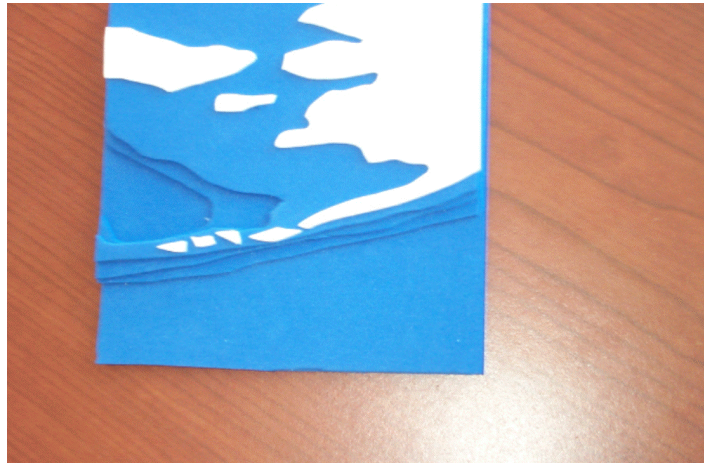


Figure it Out

Looking at your three-dimensional map of your earth structure, answer the following questions.

- A. What parts would be hard to climb? Which would be the steepest slopes? Show a classmate.
- B. What parts would be easy to climb? Which would be the least steep slopes? Show a classmate.
- C. Compare the land above sea level to the land below sea level.
- D. Using your 3-D map and your topo map, describe the topography or “shape” of your earth structure. Be sure to include the elevation, depth, steepness of the slopes, and shape of your earth structure.